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THE EFFECT OF BODY AWARENESS THERAPY AND AEROBIC EXERCISES ON PAIN AND QUALITY OF LIFE IN THE PATIENTS WITH TENSION TYPE HEADACHE

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Abstract

Background: This study is to investigate the effect of Body Awareness Therapy (BAT) and Aerobic Exercises on pain and quality of life in patients with Tension-Type Headache (TTH). **Materials and Method:** Sixty individuals with TTH diagnosis who referred Neurologist were incorporated into study. The individuals were randomly grouped into 3 as BAT (n=20), aerobic exercise (n=20) and control group (n=20). Pain severity of the individuals was evaluated by Visual Analog Scale (VAS) and pain diary, disability with ache; by Pain Disability Index (PDI) and Headache Impact Tests (HIT) and quality of life was evaluated by SF-36. Subsequent to first assessments, 3 sessions of 60 minutes per week throughout 6 weeks totally.

Results: When the groups were compared at the end of the study, a significant decrease was observed in VAS, PDI and HIT values in the individuals in the BAT and aerobic exercise groups. With the individuals in group BAT and aerobic exercise all parameters of quality of life were observed to be increased significantly.

Conclusion: BAT and aerobic exercise programs to be applied on TTH patients were concluded to be important in decreasing the pain, in increasing the quality of life and in reducing pain-related daily constraints of the individuals.

Key Words: Tension-type headache, aerobic exercise, body awareness therapy, quality of life.

Introduction

Headache disorders are the most frequent group of diseases seen in the community (Niere et al., 2009; Biondi et al., 2004). Among primary headache disorders, the most frequent one is the tension-type headache (TTH) (Groot et al., 2011; Ropper et al., 2009; Olesen, 2006). The lifelong prevalence of TTH was stated to be between 46-86% in different

studies (Stovner et al., 2007; Torelli et al., 2004). While TTH is seen in female gender more often (Bendsten et al., 2009; Crystal et al., 2010), the age of onset varies from childhood to adulthood (Dismond, 1999; Blaschek et al., 2012). Disorders of general state of health (Söderberg et al., 2011) inadequate rest, sleep disorders (Söderberg et al., 2011; Sierpina et al., 2007), irregular meal times, anxiety, depression (McGneeney, 2009; Jensen et al., 2003), fatigue (Millea et al., 2002; Center, 2000), postural defect (Giacomini et al., 2004), stress and menstrual period for women (Sierpina et al., 2007), are risk factors for headache (Bendsten et al., 2009; Boes et al., 2004). Although the main mechanism to induce TTH is still unknown at the present time (Jensen et al., 2000; Toro-Velasco et al., 2009), TTH has been claimed to be stress-related constitutively in the first performed studies (Bendsten et al., 2009; Jensen, 2001). In the recently performed studies, TTH was shown to be not only due to alterations in the peripheral mechanisms but also to be due to alterations in central mechanisms (Bendsten et al., 2009; Jensen, 2001; Bendsten et al.,2011).

In the treatment of TTH patients, basically; the aims are; to relieve the pain, to relieve the patient, to bring the patient's daily-life into minimally affected position and to increase the quality of life. In these patients, it is necessary that the treatment methods comprise all the pathologies and there is a multidisciplinary approach (Davis et al., 2008). In the treatment approaches, pharmacological and non-pharmacological methods are applied (Vernon et al., 1999; Lenssinck et al., 2004). Nowadays, in patients with TTH, as frequently applied, non-pharmacological approaches such as local cold and hot application, classical or connective tissue massage, Transcutaneous electrical nerve stimulation (TENS) (Melzack et al., 2001), ultrasound (US), electromyographic (EMG) biofeedback (Paiva et al., 1982), exercises (such as aerobic exercises, stretching exercises, posture exercises) and relaxation techniques, cognitive therapy, manual techniques as physical therapy such as soft tissue mobilization and manipulation (Fernandez-de-las, 2008; Biondi, 2005; Kanji et al., 2006) and alternative methods such as acupuncture, yoga, meditation, T'ai-Chi, and Body awareness therapy (BAT) are used (Söderberg et al., 2011; Center, 2000; Davis et al., 2008).

BAT, body awareness state, means one's awareness of self-entity. It contributes to the physical, mental and spiritual development of the individual and increases the individual's awareness of these three dimensions. Also, it provides regain and enhancement of posture, balance and natural reflexes of motion to the body. By providing body (sensory) and mind (motor) integrity; a healthy and quality life, the tension occurring by stress and chronic pain are managed

effectively (Dittrich et al., 2008; Gard, 2005). BAT is widely used in the treatment of chronic pain rehabilitation (such as musculoskeletal diseases, fibromyalgia, headache, general chronic pain) and is still being improved (Dittrich et al., 2008; Roxendal 1985).

When the frequency of TTH is considered, it is seen to cause a significant disability, workday loss and economic cost for the community (Davis et al., 2008; Lenssinck et al., 2004). Besides, TTH, can lead to a decline in quality of life and work capacity, significant inefficacy in one's daily life activities and functions (Niere et al., 2009; Stovner et al., 2007; Jensen, 2003). In this study, investigating the effect of Body Awareness Therapy (BAT) and aerobic exercises upon pain and quality of life in patients with TTH is aimed.

Methods

Data source and design

Eighty individuals with chronic TTH diagnosis who referred to Bolu Izzet Baysal Public Hospital Koroglu Unit Neurology outpatient clinics for headache complaint, were incorporated into the study. This study followed a thesis project conducted by one of the authors. The criteria to be included in the study were determined to be as: being between 18-55 years of age, being diagnosed with chronic TTH, being only headache, being able to visit the hospital independently, not having a communication difficulty or problem, being volunteer to participate in the study and the pain severity value being between 4-7 according to VAS. During treatment sessions, the patients whose pain increased positively, who had cardiac disease, cardiac arrhythmia, cardiovascular disease, who had malignancy and who received chemotherapy, radiotherapy that caused malignancy, who had any unbalancing neurologic or orthopedic disturbance, who were pregnant, who received antidepressive and antipsychotic treatment, who were alcohol and drug addict and who had mental disturbances that caused them to not to understand the exercise to be done were excluded from the study. Power analysis was conducted to determine the number of people to participate in the study. Examination was done by a medical doctor specialist for neurosurgery. After applying the inclusion and exclusion criteria, those included were referred to the physiotherapy department. Of the 80 patients with chronic TTH, 20 patient did not meet the inclusion criteria (3 patients were cardiac disease, 3 patients had antidepressive treatment, 4 patients were pregnant, 5 patients had transport difficulty and 5 patients had due to family problems not incorporated in the study). The study

included 60 chronic TTH patients. Block randomization was done by a computer-generated random number list prepared by an investigator with no clinical involvement in the trial. The volunteers were randomly assigned to three groups: BAT, aerobic exercise and control group. Sixty individuals quit the study due to being unsuitable for the inclusion criteria (Figure 1). The first and the second groups were determined to be the study group; as to the third group, it was determined to be the control group. Within the study, BAT was applied to the first group; as for the second group, the aerobic exercise program was applied. Throughout the treatment period, 2 people from aerobic exercise group had to quit due to transport difficulty, health and family problems. The study was completed with a total of 58 people (Figure 1).

Instruments

The people who were included in the study, their sociodemographic data, and their TTH knowledge were interrogated with an assessment form prior to the study and 6 weeks after the beginning of the study. The pain severity of the patients was evaluated by using VAS. VAS is a pain severity measurement scale and its reliability was demonstrated (Strong et al., 2002). Besides, a pain diary was kept to determine the headaches of the patients during the treatment period. The patients were asked to mark the days of their headache on the given chart. Pain-related disability was assessed by Pain Disability Index (PDI) and by Headache Impact Tests (HIT). PDI is a simple and rapid means to measure the constraint in normal daily functions due to pain in patients who have chronic pain. It is used to determine the patient ratings in the beginning, and the effectiveness of the interventions. This index was developed by St. Louis University Medical Center. PDI is comprised of a total of 7 parameters as follows; family and household responsibilities, entertainment, social activity, occupation, sex life, self-care and daily life activities. These parameters fall within 0-10. Zero means “I have no problems with pain”, 10 means “I have severe constraint due to pain”. The total score is calculated between 0-70 by the sum of 7 parameters (Osün et al., 2003; Biçer et al., 2004). HIT on the other hand, is implemented for questioning pain severity, work and spare time activities, fatigue, and cognitive features. It is a test composed of 6 questions applied on paper. Each item is answered in 5-item Likert scale and by summing up the points, and thus, the total score is obtained. Score and respond level are directly proportionate to each other. HIT scale is a favorable test to use because it measures both short-time and also widespread effect (Kosinski et al., 2003; Yang et

al., 2010). When carrying out the evaluation, digits at the bottom of the columns are summed up and the total score is found. The total score is between 36-78. Scoring is done as follows:

60 points and over: Headaches affect the life extremely. It restricts daily activities more severely compared to others who suffer from a headache. 56-59 points: Headaches affect daily activities significantly. 50-55 points: Headaches affect daily activities mildly. 49 points and less: Headaches do not affect daily activities yet (HIT-6T Turkey version, 2000).

SF-36 (The MOS 36-item short form health survey) form is used as a general quality of life scale. This form was developed by Ware and his co-workers and its Turkish validity and reliability adaptation was made by Kocyigit and his co-workers (Kocyiğit et al., 1999). The form is composed of a total of 36 items that can be filled by the patient. These items include 8 different dimensions concerning health. Physical function (10 items), social function (2 items), physical problems-related role constraints (3 items), emotional problems-related role constraints (3 items), mental health (5 items), liveliness (4 items), pain (2 items) general health [general perspective (5 items) and alteration in health (1 item)]. Items are scored (0 = poorest health state, 100 = best health state) and are evaluated one by one. By subscales, it evaluates the health between 0-100; and 0 indicates poor health state, 100 indicates good health state.

Treatment program

Individuals in the treatment group were taken under two different training programs. To the first group of the individuals in the treatment group (20 individuals), BAT program was applied, to the second group (20 individuals), the aerobic exercise program was applied. We were divided further into 2 more separate groups of 10 each, because 20 individuals are hard to control and difficult to get into the training program at the same time. The treatment procedure for BAT-applied group was implemented as follows: the three sections of BAT; relaxation, motion and massage were applied by a physiotherapist educated on BAT to the individuals as they were divided into 2 groups, 10 people each on 3 sessions of 60 minutes each per week for total 6 weeks. The second group of individuals were also divided into 2 separate groups; 10 people each in the same way and were taken under aerobic exercise program. The exercise protocol was consisted of 3 phases as; 5 min warm-up phase, 5 min cooling phase and 30 min aerobic exercises. Aerobic exercises, accompanied by music, were performed via step-dance board by beginning with 30 min and progressively

increasing the time. Aerobic exercise intensity was tasked at the submaximal level. To keep the aerobic exercise intensity at the submaximal level, original 6-20 points Rating of Perceived Exertion (BORG scale) was used.[94] Each session intensity was designated to correspond to the 13-14 points of 6-20 points BORG scale. This point is adapted to exercise intensity which corresponds to 65-70% of maximum heart rate by the American College of Sports Medicine. By following the BORG scale, the exercise intensity was regulated with the exercise repeat times and increasing its duration progressively (Borg, 1998).

As for the control group, there was no application practiced. However, as the study ended, the individuals of the control group were asked whether they wanted to participate in BAT or aerobic exercise programs. Those who wanted to participate were included in the treatment program.

Ethical approval of the study protocol

The study was assessed by the Abant Izzet Baysal University Ethical Committee and was approved ethically (2011/56). Each patient was informed of the method and the goal of the study and the patient consent form was signed by them with regard to participating in the study willingly.

Statistical Analyses

The descriptive statistics belonging to obtained measurements were given as mean ±Standard Deviation, number and % frequencies. In the comparison of the groups in terms of numerical/quantitative type demographic measurements and clinical features, single direction variance analysis was used and for determination of the different groups, post hoc Turkey test was used. In categorical measurements done prior to and after the treatment program, chi square analysis was utilized to determine the difference between the groups. The relationship between the Numerical/Quantitative measurements was examined via correlation analysis. Last value carried forward" method was used. Kolmogorov-Smirnov test was used for checking of normality. The statistical significance level in the analysis of the data was determined as $p<0,05$. For statistical operations, PASW (SPSS, 18) package was used.

Results

Sixty chronic TTH diagnosed individuals whose average of age was 39.26±9.23 years, were incorporated in the study. The physical features of the individuals who were incorporated into the study were given in Table1.

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In the statistical analysis that was performed, there was no difference found between the groups concerning age, body weight, body height and body mass index (BMI) ($p>0.05$) (Table1).

The distribution of headache frequency among the groups in last 3, last 6 and last 12 months was observed not to show a significant difference ($p>0.05$). It was medication/drug which was frequently used the method of treatment for the headache of the individuals who were incorporated in groups 1, 2 and 3 and there was no significant difference found in terms of the applied treatment methods for the headache between the groups ($p>0.05$) (Table 2).

While in individuals in BAT group and in aerobic exercise group, there was a difference found in VAS, PDI and HIT values prior to and after the treatment ($p<0.05$); in individuals in control group, there was no difference found ($p>0.05$). While there was a difference found between PF, RP, VT, RE, MH, PCS, MCS values prior to and after the treatment of the individuals in BAT group; in individuals in aerobic exercise group, there was a difference found between PF, BP, VT, MH values ($p<0.05$). While there was a difference between MH values prior to and after the treatment of individuals in control group ($p<0.05$); there was no difference found between PF, RP, BP, GH, VT, SF, RE, PCS, MCS values ($p>0.05$) (Table 3).

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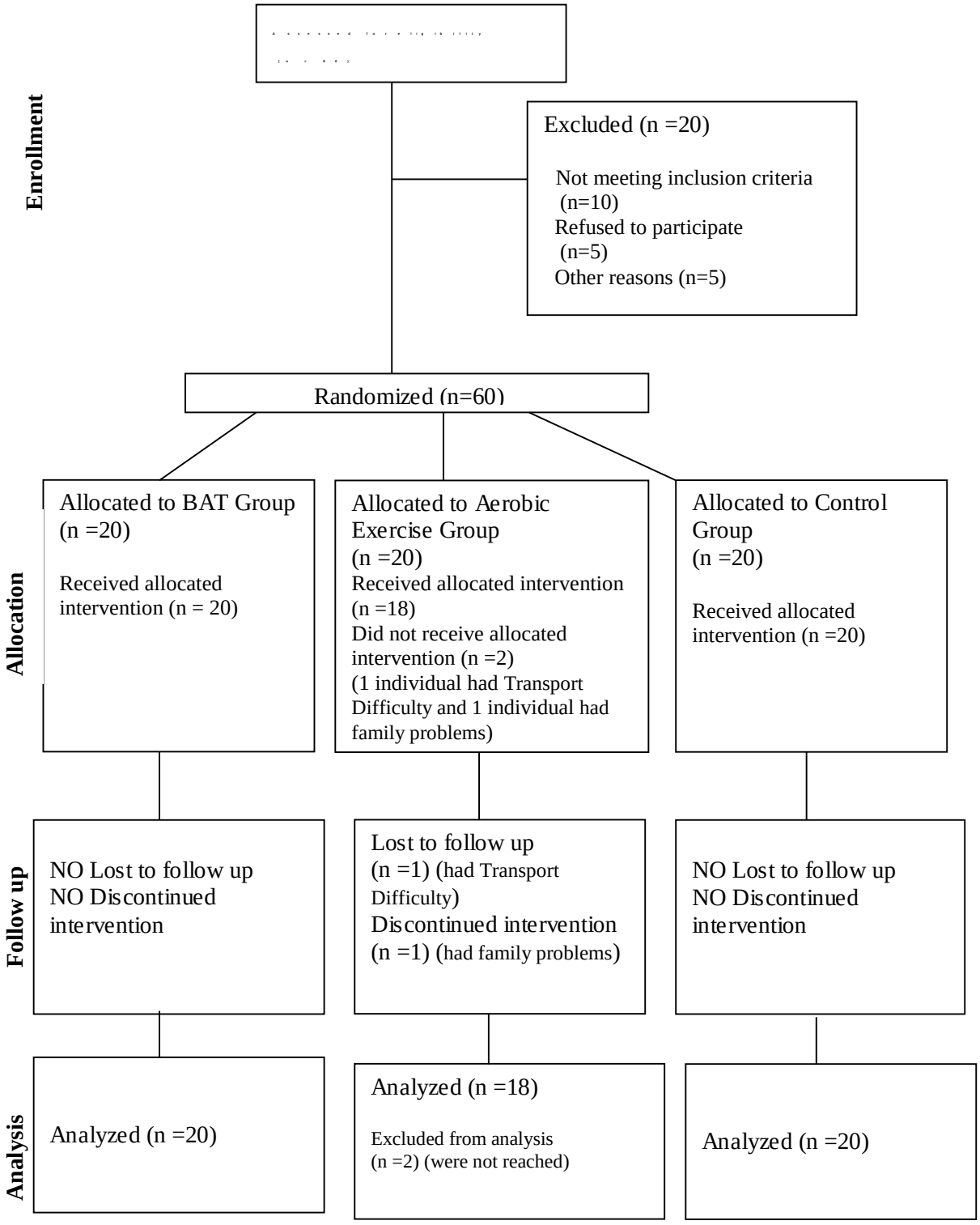

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Table 1: Physical Features of the Participants

	BAT Group X±SS	AE Group X±SS	Control Group X±SS	F	p
Age (year)	42.6±9.5	36.20±7.86	39.00±9.53	2.54	0.08
Body weight (kg)	69.71±15.38	69.26±13.32	65.69±9.08	0.58	0.56
Body height (m)	1.59±0.06	1.59±0.04	1.60±0.05	0.06	0.93
BMI (kg/m^2)	27.31±5.6	27.10±4.6	25.66±3.71	0.73	0.48

One way analysis of variance, BAT: Body Awareness Therapy; AE: Aerobic Exercise

Table 2: The distribution of the difference between treatment methods which were applied for the headache previously and pain frequency of the people in last 3, 6 and 12 months.

	Pain times	BAT Group n	%	AE Group n	%	Control Group n	%	χ^2	P
Last 3 Months	**1–7 times**	10	50	9	45	5	25		
	8–14 times	4	20	6	30	8	40		
	15–30 times	4	20	4	20	3	15		
	31–160 times	2	10	1	5	3	15	6.26	0.61
	180 and above	-	-	-	-	1	5		
Last 6 Months	**1–7 times**	3	15	2	10	1	5		
	8–14 times	6	30	7	35	5	25		
	15–30 times	5	25	6	30	7	35	5.73	0.67
	31–160 times	6	30	4	20	4	20		

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	180 and above	-	-	1	5	3	15		
	1–7 times	1	5	1	5	1	5		
	8–14 times	4	20	2	10	3	15		
	15–30 times	6	30	11	55	3	15		
	31–160 times	6	30	3	15	10	50	12.46	0.25
Last 12 Months	**180 and above**	3	15	3	15	3	15		
	Medicine	19	95	20	100	19	95		
Treatment	**Psychotherapy**	1	5	-	-	1	5	1.03	0.59
Methods	**Total**	20	100	20	100	20	100		

χ^2: Chi-square test, BAT: Body Awareness Therapy, AE: Aerobic Exercise

Table 3: The comparison of VAS, PDI, HIT and SF-36 values before and after treatment of people in each group

		Before Treatment	**After Treatment**	**t**	**p**
		X±SS	**X±SS**		
BAT GROUP	**VAS**	6.15±0.74	2.50±1.14	12.1	**0.00***
	PDI	32.85±13.34	16.75±12.57	4.13	**0.00***
	HIT	62.25±6.71	52.45±7.76	4.68	**0.00***
	PF	46.05±8.38	52.31±5.1	-2.93	**0.00***
	RP	41.39±12.3	49.15±10.48	-2.21	**0.03***
	BP	41.51±8.85	45.75±8.63	-1.61	0.12
	GH	43.62±10.23	45.89±11.01	-1.14	0.26
	VT	44.80±9.26	49.78±8.26	-2.38	**0.02***

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	SF	42.21±10.82	44.37±9.35	-0.69	0.49
	RE	37.93±14.2	47.40±13.17	-3.21	**0.00***
	MH	37.49±9.68	41.91±8.9	-2.51	**0.02***
	PCS	43.76±7.44	48.74±7.88	-2.29	**0.03***
	MCS	39.07±12.18	43.91±7.8	-2.57	**0.01***
	VAS	6.1±1.02	3.00±1.28	8.42	**0.00***
	PDI	32.33±10.34	19.94±12.59	4.63	**0.00***
	HIT	63.83±3.8	51.50±7.03	6.32	**0.00***
	PF	45.97±8.08	51.21±4.52	-2.70	**0.01***
	RP	44.05±10.77	47.59±11.48	-0.90	0.37
	BP	37.65±5.71	46.15±7.37	-3.93	**0.00***
	GH	44.43±9.28	46.34±9.35	-0.87	0.39
	VT	41.83±5.52	51.30±8.13	-4.41	**0.00***
AE GROUP	**SF**	36.32±6.24	44.16±9.69	-2.81	**0.01***
	RE	41.26±14.44	45.94±13.46	-0.92	0.36
	MH	37.31±8.41	44.38±8.13	-2.84	**0.01***
	PCS	43.07±8.7	47.70±5.52	-1.78	0.09
	MCS	38.03±9.2	45.20±9.4	-2.10	0.05
	VAS	5.90±0.71	5.65±0.74	2.03	0.05
	PDI	27.10±9.97	26.10±10.39	0.65	0.52
	HIT	59.95±7.71	59.30±6.89	0.49	0.62
	PF	45.92±11.28	48.36±9.44	-1.22	0.23
	RP	40.69±12.86	39.98±12.76	-0.37	0.71
	BP	43.64±10.25	45.87±10.30	-1.57	0.13
	GH	42.46±10.75	42.56±11.81	-0.05	0.95

	VT	43.02±11.03	43.72±9.65	-0.27	0.78
CONTROL	**SF**	37.87±10.03	40.85±11.54	-1.02	0.31
GROUP	**RE**	37.41±13.71	41.10±14.58	-1.28	0.21
	MH	35.45±10.57	38.86±9.74	-2.61	**0.05***
	PCS	44.32±8.72	44.42±9.23	-0.07	0.94
	MCS	36.37±11.58	39.61±12.34	-1.48	0.15

*p<0.05, paired t-test in each treatment group, VAS: Pain severity scale, PDI: Pain Disability Index, HIT: Headache impact test, PF: Physical function, RP: Role-physical, BP: Body perception, GH: General Health, VT: Vitality, SF: Social function, RE: Role-emotional, MH: Mental health, PCS: Physical health, MCS: General mental health

In the statistical analysis that was performed, there was no difference found between VAS, PDI and HIT values prior to the treatment among the groups (p>0.05). As to after the treatment, there was a difference found among the groups concerning VAS, PDI and HIT values (p<0.05). VAS and HIT values were found to be significantly low both in BAT group and in aerobic exercise group. As for the PDI values, they were found to be significantly low in BAT group. Among the groups, there was no variation found between PF, RP, BP, GH, VT, SF, RE, MH, PCS, MCS values prior to the treatment (p>0.05). As for after the treatment, there was a difference found among the groups concerning RP and VT values (p<0.05). RP values in BAT group and in aerobic exercise group were found to be significantly high, VT values in aerobic exercise group were found to be significantly high (Table 4). When the differentials of PF, RP, BP, GH, VT, SF, RE, MH, PCS, MCS among the groups prior to and after the treatment were taken, only the VT differential was found to be different for aerobic exercise group (p<0.05) (Table 4).

The individuals in each of treatment and control groups who were incorporated in the study were those who had moderate degree pain; in these individuals, there was a statistically difference found concerning the average number of days which were noted in the pain diary. As the average number of days of pain in individuals who had mild and severe pain is concerned, statistically no difference was found among the individuals in each three groups (p>0.05). The average number of days which were noted in the pain diary in individuals who had moderate degree pain was found to be significantly high in control group (p<0.05). In the statistical analysis which was performed, there was a difference

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found between the groups in using medication when in pain according to the pain diary (p>0.05). Medication use was found to be significantly low in aerobic group (Table 5). **Table 4:** The comparison of VAS, PDI, HIT and SF-36 values among the groups before treatment and after treatment

	Group	Before treatment			After treatment		
		X±SS	F	p	X±SS	F	p
VAS	BAT Group	6.15±0.74	0.49	0.61	2.50±1.14	49.14	0.00*
	AE Group	6.10±1.02			3.00±1.28		
	Control Group	5.90±0.71			5.65±0.74*		
PDI	BAT Group	32.85±13.34	1.46	0.24	16.75±12.57*	3.19	0.04*
	AE Group	31.70±10.1			19.94±12.59		
	Control Group	27.10±9.97			26.10±10.39		
HIT	BAT Group	62.25±6.71	0.67	0.51	52.45±7.76	6.72	0.00*
	AE Group	61.00±3.72			51.50±7.03		
	Control Group	59.95±7.71			59.30±6.89*		
PF	BAT Group	46.05±8.38	0.001	0.999	52.31±5.1	1.79	0.17
	AE Group	45.94±7.65			51.21±4.52		
	Control Group	45.92±1.28			48.36±9.44		
RP	BAT Group	41.39±12.3	0.375	0.689	49.15±10.48	3.53	0.03*
	AE Group	43.86±11.18			47.59±11.48		
	Control Group	40.69±12.86			39.98±12.76		
BP	BAT Group	41.51±8.85	1.849	0.167	45.75±8.63	0.01	0.99
	AE Group	38.34±6.87			46.15±7.37		
	Control Group	43.64±10.25			45.87±10.3		
GH	BAT Group	43.62±10.23	0.106	0.899	45.89±10.01	0.71	0.49
	AE Group	43.86±9.79			46.34±9.35		

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	Control Group	42.46±10.75			42.56±11.81		
	BAT Group	44.80±9.26			49.78±8.26		
VT	**AE Group**	42.56±6.13	0.334	0.718	51.30±8.13	4.08	0.02*
	Control Group	43.02±11.31			43.72±9.65		
	BAT Group	42.21±10.82			44.37±9.35		
SF	**AE Group**	36.51±6.24	2.097	0.132	44.16±9.69	0.73	0.48
	Control Group	37.87±10.03			40.85±11.54		
	BAT Group	37.93±14.2			47.40±13.17		
RE	**AE Group**	41.09±14.6	0.394	0.676	45.94±13.46	1.14	0.32
	Control Group	37.41±13.71			41.10±14.58		
	BAT Group	37.49±9.68			41.91±8.9		
MH	**AE Group**	36.81±8.62	0.230	0.795	44.38±8.13	1.81	0.17
	Control Group	35.45±10.57			38.86±9.74		
	BAT Group	43.76±7.44			48.74±7.88		
PCS	**AE Group**	43.21±8.54	0.090	0.914	47.70±5.52	1.67	0.19
	Control Group	44.32±8.72			44.42±9.23		
	BAT Group	39.07±12.18			43.91±7.8		
MCS	**AE Group**	37.92±9.18	0.349	0.707	45.20±9.4	1.64	0.20
	Control Group	36.17±11.58			39.61±12.34		

*p<0,05, One way analysis of variance in each period, VAS: Pain severity scale, PDI: Pain Disability Index, HIT: Headache Impact Test, PF: Physical function, RP: Role-physical, BP: Body perception, GH: General health, VT: Vitality, SF: Social function, RE: Role-emotional, MH: Mental health, PCS: Physical health, MCS: General mental health

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Table 5: The comparison of average day values according to pain diary of people, among the groups

		BAT Group X±SS	AE Group X±SS	Control Group X±SS	F	p
Pain Diary (Day)	Mild	2.55±3.26	1.33±1.41	1.45±2.56	1.33	0,27
	Intermediate	2.20±2.44	1.61±2.42	4.00±3.74	3.43	0,03*
	Severe	0.50±0.88	0.38±0.69	1.15±1.53	2.67	0,07
Analgesics Use		0,96±0,22	0.65±0.48*	1.10±0.44	6.43	0.00*

*p<0,05, One way analysis of variance in each period

Discussion

The pharmacological treatment methods used frequently in individuals who have a headache include; analgesics, antidepressants, myorelaxants and non-steroidal anti-inflammatory drugs (Furnal et al., 2008; Penacoba-Puente et al., 2008). In fact, it was medication which was frequently used as the method of treatment for a headache in participant individuals in our study. However, in recent years, due to cost-effective programs being in the forefront in healthcare and the problems arising from the side-effects of the medications, popularized the use of physiotherapy and rehabilitation practices and alternative treatment methods (Ertaş et al., 2012; Holroyd et al., 2001). In recent years, the number of studies which concentrate on different effects of different treatment methods on headache patients has increased. The effects of many of these treatment methods have not been completely proven yet (Penacoba-Puente et al., 2008; Bigal et al., 2009; Davis et al., 2008). Accordingly, the aim of our study is to research the effect of body awareness therapy (BAT) and aerobic exercises upon pain and quality of life in patients with a tension-type headache (TTH).

The number of studies that examine the effectiveness of BAT and aerobic exercise in patients with TTH is quite a few. However, there are many studies available which research the effect of different exercise approaches upon pain (Fernandes-de-las-Penas, 2008). The effectiveness of aerobic exercises on migraine patients has been studied more (Dittrich et al., 2008; Köseoğlu et al., 2003; Busch et al., 2008; Varkey et al., 2009). In addition to this, relaxation

methods have been used frequently in TTH treatment and their effectiveness in different patient groups has been proven. The effect of relaxation and cognitive behavior treatments, biofeedback practices are explained by physiopsychological mechanisms in the literature (Paiva et al., 1982). According to this, being nervous, stressed, operating with stiff muscles while working in daily life lead to pain especially in the stiff muscle and around it, sensitiveness, nervousness, fatigue and this can manifest as TTH in advanced stages. By relaxation training, to relax the stiff muscles of the individuals, to ensure the better feeling of them and them to complete the activity with less effort are aimed (Söderberg et al., 2011; Furnal et al., 2008). It has been proven that relaxation therapy reduces stress. Progressive relaxation focuses on respiration and relaxation of certain muscle groups. In a study which was performed, in 96% of patients with a headache, frequency of pain, duration of pain and severity of pain were reported to be declined after 10 sessions of relaxation therapy (Holroyd et al., 2001). Pamela D'Souza and her co-workers stated that relaxation techniques calm people with a headache and decrease the negative mood. The same study found that after relaxation training for 3 months, it reduces the headache frequency, headache-related disability and physical symptoms of the unconscious mind in patients when compared with control group (D'Souza et al., 2008). In our study, a significant decrease was found in pain frequency (pain diary), pain severity (VAS) and pain related disabilities (PDI and HIT) after the study in BAT applied individuals, which is consistent with the previous studies.

Although there is not enough evidence to be efficient in systematic review studies about the effectiveness of physiotherapy practices, exercise and spinal manipulation practices in a headache in patients with TTH; there are studies that address the efficiency of exercise practices in patients with a headache (Osün et al., 2003; Fernandez-de-las-Penas et al., 2006). Although there are many physiologic effects of exercise practices, in patients with a headache the emphasis is laid on two mechanisms: decreasing peripheral sensitization and activation of descending inhibitory pathways. By aerobic exercise; power, durability, flexibility increase, activity level rises, sense of auto-control is enhanced, muscle relaxation is supported by providing the antidepressant effect. Consequently, the effect of pain lessens. The reason for that is the increase in beta-endorphin etc. values, prolactin and GH secretion and the reduction of pain by these hormones (Osün et al., 2003; Furnal et al., 2008; Köseoğlu et al., 2003). Koseoglu and his co-workers reported in their study that they examined the aerobic exercise and plasma beta-endorphin levels in

patients with a migraine without aura, and found the beneficial effects of exercise on all migraine parameters. The increase in beta-endorphin levels is reported both after home exercise program and also after treadmill training. As a result, in this study, beneficial effects of the exercise was emphasized to exist especially in those patients with migraine without aura, whose basic beta-endorphin levels are low (Köseoğlu et al., 2003). In the collection study that was performed by Busch and Gaul, it was reported that there was a significant decrease in migraine attacks, pain severity, pain frequency and duration of pain, as a result of aerobic exercise programs applied on migraine patients. In the conclusion of the study, they emphasized that exercises which are done regularly for 2 or 3 times in a week might reduce the headache frequency (Busch et al., 2008). In our study also in agreement with other studies that were performed, aerobic exercise application was shown to reduce the severity of the headache in patients with TTH.

Canady reported a reduction in headaches of patients, reduction in analgesic/painkiller use, and reduction in symptoms such as anxiety during treatment as a result of 8 weeks of aerobic exercise training which is done on patients with TTH and that exercise to be an effective treatment method in TTH treatment (Canady, 2002). In our study, a significant decrease was determined in pain frequency (pain diary), pain severity (VAS), pain related medicine use and pain related disabilities (PDI and HIT) of the patients with TTH on whom aerobic exercise was applied; and a significant increase in the parameters of quality of life such as physical function, body perception, vitality, social function and mental health were recorded. By finding the same conclusion with studies, we consider exercise to have an acute analgesic effect and by increasing endorphin production in the body; reducing the negative conditions such as fatigue, depression, anxiety. This is because exercise decreases the stress level and decreases the negative conditions arise in human body resulting from muscle tension and stress-related chemical substance secretion into blood circulation. It provides relaxation, increases blood and lymphatic circulation, provides more oxygen delivery to the tissues of the body and provides removal of toxins from the body more rapidly. Thus, it increases endorphin production in the body; decreases fatigue, depression, anxiety; enhances sleep and life quality. Likewise, it was discovered that exercise has an acute analgesic effect on healthy individuals (Guyton, 1996). Besides, the analgesic use rate was found to be decreased in those groups who received treatment in our study.

In studies that examined the effect of BAT in different follow-up periods in those patients who had schizophrenia, chronic musculoskeletal system disease, psychosomatic problem fibromyalgia syndrome, non-specific musculoskeletal system diseases; it was reported that after BAT application, there was significant enhancement in the quality of motion, body perception, self-confidence, sexual relationship level, social communication, thinking capability, pain and psychogenic distress, quality of life parameters; that there were a decrease in stress-related symptoms, an increase in self-sufficiency, a decrease in depressive mood, a decrease in anxiety, better expression of their feelings and positive alteration in their lifestyle (Landsman et al., 2004; Hedlund et al., 2010). In comparative studies that were performed, BAT was found to be more effective than conventional treatment approaches (such as; massage, TENS, acupuncture, exercise training, mobilization) (Gard, 2005; Malmgren-olsson et al., 2011).

Mannix and et al. found that the applied relaxation methods were to increase the quality of life of patients with TTH significantly compared to the control group (Mannix et al., 1999). Similarly, Söderberg and et al. also emphasized that by increasing the central nervous system-related symptoms affecting the well-being state (such as; satisfaction-happiness, self-managing, self-confidence, vitality-endurance, concentration, enthusiasm, sleep-night's sleep, quality of sleep), the relaxation techniques in patients with TTH increase the well-being state and increase the quality of life, therefore, the relaxation techniques which were to be used for the patients with TTH are quite important (Söderberg et al., 2011). In consistence with the literature, in those individuals on whom BAT was applied in our study, a significant decrease in pain frequency (pain diary), in pain severity (VAS) and in pain related disabilities (PDI and HIT) was found; an increase in the parameters of quality of life such as physical function, role-physical, vitality, role-emotional, mental health, physical health and general mental health was observed. The pain-related functional constraint related to pain severity in daily life decreased with a decrease of pain and with an increase in work and spare time activities, the life satisfaction and quality of life of the individual increased. Pain leads to a serious functional loss in daily life and reduces the quality of life dramatically. Therefore, to reduce pain in individuals with TTH and to bring it under control are quite important factors in increasing the quality of life (Stovner et al., 2007).

There was no comparative study that was encountered in literature examining the effectiveness of BAT and aerobic exercise in patients with TTH. This study bears the qualification of being the first study on this subject that is

performed. However, there are different studies researching the superiority of different treatment methods on each other in patients with TTH (Bigal et al., 2009; Davis et al., 2008). In our study, while it was seen that both treatment methods to be more successful when compared to the control group in decreasing the pain frequency, pain severity, duration of pain, pain-related disability, pain-related medication use and increasing the quality of life; aerobic exercise program and BAT were found to have similar effects in terms of decreasing the frequency and duration of pain and reducing the severity of pain-related disability, and BAT to be more effective in parameters of quality of life as; role-physical, role-emotional, general health and general mental health. On the other hand, aerobic exercises were observed to be more effective in pain-related medication use and the parameters of quality of life such as body perception and social function.

Conclusion

We consider the approaches in which the active exercise programs to be applied to patients with TTH, and the BAT methods to be applied together, to be successful in decreasing the pain frequency, pain severity, duration of pain, pain-related medication use, pain-related disability; in increasing the quality of life and in reducing the TTH-related symptoms to minimum. As part of the active exercise program, even though the patient cannot exercise regularly, the patient should be kept away from physical inactivity by physical exercises as walking, jogging, cycling, and s/he should be encouraged about leading a constantly active life. This study bears the qualification of being the first study that examines the effectiveness of BAT and aerobic exercise programs in patients with TTH, and we are of the opinion that there will be more studies to be performed on this subject.

Conflict of interest: The authors declare that there is no conflict of interests regarding the publication of this article.

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